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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/699,505	10/30/2003	Girish Upadhy	COOL-00601	3573

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HAVERSTOCK & OWENS LLP
162 NORTH WOLFE ROAD
SUNNYVALE, CA 94086

EXAMINER

MCKINNON, TERRELL L

ART UNIT PAPER NUMBER

3743

DATE MAILED: 12/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/699,505

Applicant(s)

UPADHYA ET AL.

Examiner

Terrell L Mckinnon

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 January 1971.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-71 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,9-20,27-34,47,62,63,65,66,68,70 and 71 is/are rejected.
- 7) ☒ Claim(s) 3-8,21-26,35-46,48-61,64,67 and 69 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 03/03 & 08/2004.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 9-13, 17-20, 27-34, and 47 are rejected under 35 U.S.C. 102(b) as being anticipated by Reichard (U.S. 5,316,077).

Reichard discloses an heat sink microchannel cooling system comprising:

- a flat plate heat exchanger, wherein the flat plate heat exchanger comprises a top plate and a base plate coupled together;
- a plurality of fins coupled to the top plate; wherein the base plate comprises: fluid inlet configured to receive flow of a fluid in a heated state therethrough;
- a plurality of channels coupled to the fluid inlet and configured to receive and to cool the fluid;
- and a fluid outlet coupled to the plurality of channels and configured to receive the cooled fluid and to allow the cooled fluid to exit the device;
- the device is coupled to a heat source; and one or more pumps configured to circulate the fluid to and from the one or more fluid channel heat exchangers;
- the fluid channels comprises pins (74, 76, 88 and 92) protruding and perpendicular to the surface;
- the channels are in parallel and serpentine configuration;
- a leakproof barrier is interposed between the plates;
- and the plates are made from metal having good conductivity.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Reichard (U.S. 5,316,077) in view of Hubbuch et al. (U.S. 2,039,593).

Reichard's invention discloses all of the claimed limitations except for a second plurality of fins coupled to the base plate.

5. However, Hubbuch discloses a heat transfer coil (10) comprising two plates with fins attached to each plate.

Given the teaching of Hubbuch, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the microcooling system of Reichard with a second plurality of fins coupled to the base plate.

Doing so would increase heat transfer

6. Claims 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reichard (U.S. 5,316,077) in view of Hubbuch et al. (U.S. 2,039,593) as applied to claims above, and further in view of Zingher (U.S. 5,310,440).

Reichard's invention, as modified by Hubbuch, discloses all of the claimed limitations except for the plurality of channels, inlet and outlets, are in a radial, spiral or annular configuration.

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7. However, Zingher discloses the plurality of channels comprising inlet and outlet are in a radial, spiral or annular configuration (Figs. 25A-25D).

Given the teaching of Zingher, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the microcooling system of Reichard with the plurality of channels comprising inlet and outlet are in a radial, spiral or annular configuration.

Doing so would provide a conductive flow path for increasing heat transfer.

8. Claim 62, 63, 65-68, 70 and 71 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hubbuch (U.S. 2,039,593) in view of Tuckerman et al (U.S. 4,450,472).

Hubbuch discloses an heat sink microchannel cooling system comprising:

- a flat plate heat exchanger, wherein the flat plate heat exchanger comprises a top plate and a base plate coupled together;
- a method of making the heat exchanger having a plurality of first extruded fins coupled to the top plate;
- a plurality of second fins formed by extrusion; the base plate comprises: fluid inlet configured to receive flow of a fluid in a heated state therethrough;
- a plurality of channels coupled to the fluid inlet and configured to receive and to cool the fluid;
- and a fluid outlet coupled to the plurality of channels and configured to receive the cooled fluid and to allow the cooled fluid to exit the device;
- the device is capable of being coupled to a heat source; and one or more pumps configured to circulate the fluid to and from the one or more fluid channel heat exchangers;
- channels are in parallel configuration; a leakproof barrier is interposed between the plates; and the plates are made from metal having good conductivity.

Hubbuch fails to disclose the first and second finned extruded elements being coupled by soldering and/or multiple soldering operations; and the use of epoxy to join

the first and second element together.

9. However, Tuckerman discloses the use of cooling elements being coupled by soldering and/or multiple soldering operations; and the use of epoxy to join the first and second element together (column 3, lines 63-column 4, line 2).

Given the disclosure of Tuckerman, it would have been obvious to one of ordinary skill in the art at the time of the invention to solder, weld or use some type of adhesive to attach to plate and fins to one another.

Doing so would provide a reliable connection between the conductive surfaces.

Allowable Subject Matter

10. Claims 3-8, 21-26, 35-46, 48-61, 64, 67 and 69 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following references are cited for disclosing related limitations of the applicant's claimed and disclosed invention. Hamilton et al and Aid.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Terrell L Mckinnon whose telephone number is 571-272-

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4797. The examiner can normally be reached on Monday -Thursday and every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Henry Bennett can be reached on 571-272-4791. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Terrell L McKinnon
Primary Examiner
Art Unit 3743
December 27, 2004